

Sigrid Schmalzer, *Red Revolution, Green Revolution: Scientific Farming in Socialist China*

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Sigrid Schmalzer's fascinating new book *Red Revolution, Green Revolution* provides a rare account of the philosophy, the achievements, and the actors of an agricultural transformation. This development, which occurred in China during the 1960s and 1970s, often has been referred to as China's Green Revolution; however, as Schmalzer shows, "scientific farming" (科学种田), as the campaign was officially named, was distinctly different from the purely technocratic approaches that were applied in countries supported by Western development aid.

The term *Green Revolution* was first used around 1968 by William Gaud, director of the US Agency for International Development (USAID), as a description of the modernization of traditional agriculture by introducing high-yield grain varieties, agrochemicals, and mechanization. In a speech on USAID's efforts to support agricultural productivity in developing countries, he said: "These and other developments in the field of agriculture contain the makings of a new revolution. It is not a violent Red Revolution like that of the Soviets. . . . I call it the Green Revolution. This new revolution can be as significant and as beneficial to mankind as the industrial revolution of a century and a half ago" (Gaud 1968).

In the 1960s, the People's Republic of China, as a nonaligned communist country, found itself in quite an isolated position, almost excluded from international aid and scientific collaboration and unable to benefit from technologies introduced by USAID. However, Schmalzer's book provides evidence that at the same time the country was able to achieve comparable advances in securing food production. Even though Chinese propaganda posters and photos of that time might show an idealized vision rather than a realistic one, the achievements were still remarkable. Of course, the introduction of modern machines and the mechanization of agriculture were probably slower than the propaganda suggests. Tractors were, we might assume, in short supply, and airplanes spraying pesticides were a rare exception. Statistics prove that the consumption of chemical fertilizers in the 1970s was low compared to the amounts

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applied to agricultural fields today. But there also were astonishing accomplishments, for example, in genetic research. Even though the country could not benefit from the major breakthrough in hybrid rice research by the International Rice Research Institute in the Philippines (sponsored by USAID), Chinese scientists were simultaneously able to develop Chinese hybrid rice and wheat varieties and thus contributed to the radical improvement of grain yields in China since the 1970s.

Schmalzer shows that, unlike USAID's technocratic approach, the Chinese Green Revolution strove to combine technological modernization with elements of Maoist ideology such as promotion of self-reliance, mass participation, and grassroots science. By 1965, the so-called agricultural scientific experiment movement that was initiated in the early 1960s, right after the devastating famine of the Great Leap Forward, consisted of a nationwide network of some eight thousand grassroots scientific experiment groups and four thousand rural agricultural schools organizing evening classes for peasants. Schmalzer lifts the veil on how the scientific farming campaign strove to tie traditional, indigenous knowledge—*tu* (土) science (earthy, homegrown, native, mass-based)—with foreign *yang* (洋) science (professional, international). She argues that this campaign was not characterized by conflict or competition between pro-science and anti-science grassroots factions; instead, it was a pragmatic attempt to combine the advantages of both.

The particularity of the book is that it approaches the topic from a variety of angles and introduces the perceptions of different actors who participated in the scientific farming experiment. On the basis of literature review, analysis of diaries, and personal recollections of contemporary witnesses, Schmalzer reconstructs the perspectives of the main actors, namely, agricultural scientists, local cadres and government-employed agrotechnicians, peasants, and so-called sent-down educated youth. Most of the interviews with participants of the movement were conducted in rural areas of Guangxi.

The contribution of agricultural scientists to scientific farming is represented by vivid portraits of Pu Zhelong (蒲蜚龙 1912–97) and Yuan Longping (袁隆平 1930–). Pu, an entomologist who dedicated his career to biological pest management, was a *yang* scientist, but his research focus had a *tu* approach. In the wartime China of the 1940s, when his university in eastern China had been evacuated to Yunnan in the southwest, he began experimenting with biological control of forest pest insects. Later, he had the chance to enroll in a program at the University of Minnesota, where he received his PhD in 1948. In 1949, Pu and his wife, an entomologist herself, returned to China. Pu continued to pursue biological pest control research (以虫治虫, “bug-eat-bug,” as it was called in the scientific farming campaign) at Zhongshan University in Guangzhou. Pu's research focused on the cultivation of parasitic wasps as natural predators of pest insects such as the sugarcane stem borer and stinkbugs. In the first decade of the People's Republic of China, Pu successfully cooperated with advisers from the Soviet Union at his university, and with their help, he was able to import specific types of ladybugs known for their efficient control of aphids.

After breaking with the Soviet Union, and with continuing tensions with the United States, biological pest control became especially valuable when China was facing difficulties in importing agrochemicals from international suppliers. In the early 1970s, Pu set up an experimental ground for biological insect control in the Big Sand People's Commune in Guangdong. The commune, which experimented with different pest

control practices that relied on ducks, frogs, wasps, and other biotechnologies, soon became a showcase for Mao's Green Revolution. Several foreign experts visited the commune, including Norman Borlaug (internationally praised as the father of the Green Revolution), a delegation of US insect control experts, and a delegation from the International Rice Research Institute in the Philippines. They were received by Pu, who in fluent English introduced them to Big Sand's experiments. The visitors wrote enthusiastic reports about Big Sand and developed international impressions of Maoist China's achievements in biological pest control.

Chapter 3 is devoted to Yuan Longping, the so-called father of Chinese hybrid rice. Schmalzer shows how Yuan's career fits into the pattern of scientific farming and also how it differed slightly to Pu's. Yuan had already achieved his major breakthrough in the early 1970s with genetic experiments to develop hybrid sorghum and hybrid rice, but his findings were not made public during the Mao era; his personal contribution to hybrid rice research became known only later, during the reform period.

In the early 1950s, Yuan graduated from Southwest Agricultural University in Chongqing and then worked for many years as a teacher at an agricultural school in a remote area in western Hunan. There, in Qianyang, he and his coworkers conducted most of the experiments on hybrid rice. Academically Yuan was a *tu* scientist, but he became involved in genetic research, a field that is typical of *yang* science. His most important contribution to crop science became known only under Mao's successor Hua Guofeng. Hua strove to modernize agriculture and to make the Maoist Learn from Dazhai campaign compatible with the Four Modernizations. In 1977, Hua's speech at the first national conference on hybrid rice gave the official green light to genetic research. Schmalzer notes that Yuan himself on many occasions expressed his gratitude for Hua's support. Modern Chinese biographies of Yuan, however, remain silent on Hua's involvement and instead link the promotion of hybrid rice to Deng Xiaoping: "In resolving our food problem, we have relied on 'two Pings.' We rely on Deng Xiaoping (for the responsibility system) and we rely on Yuan Longping (for hybrid rice)" (87).

Under the economic reform policy, Yuan's achievements in genetics also became an interesting commodity for international agricultural companies. In 1979, a US delegation led by the industrialist Armand Hammer visited China and was informed of its hybrid rice. The visit led to an agreement between Armand's company, Ring Around Products, and the China National Seed Corporation on the exchange of US hybrid cotton for China's hybrid rice. With that deal, one US company secured international rights to grow and market Chinese hybrid rice.

The fourth chapter is devoted to the peasants' role in scientific farming and whether it led to "skilling" or "deskilling." After the purge of rightist intellectuals and scientists during the 1950s, Maoist propaganda called on mass contributions to agricultural science and inventions. In practice, the number of peasants participating in scientific farming experiments was small, and in some cases, there are doubts about the legitimacy of their achievements. Schmalzer shows how peasants played an important role in the scientific farming campaign as providers of indigenous and traditional knowledge about farming practices and skills. Because production capacities for agrochemicals were still limited, the dissemination of knowledge of biological pest management and organic fertilizers (so-called farmer's fertilizers) was regarded as crucial. "Old peasants," for example, were asked to recollect their knowledge of

traditional technologies and skills on pest and fertilizer management. The approach of scientific farming was to disseminate this kind of traditional practice to other parts of China where they might have been unknown and could be introduced as new practices or skills. In this context, traditional agricultural handbooks from the Imperial and Republican eras were reprinted and studied for their applicability to modern agriculture.

The fifth chapter looks at the role of the state, represented by local cadres and government-employed agrotechnicians. Schmalzer proves that local cadres played an important role in promoting scientific farming: convincing reluctant or even resistant peasants to participate and experiment with new varieties, technology, or farming practices often relied on their efforts alone.

As shown in chapter 6, the sent-down educated youth—an estimated 12 million young urban people relocated to the countryside in the 1960s—was another group that played an important role in the implementation of scientific farming. Numerous propaganda posters and photos of that time illustrate the involvement of former high school and university students in scientific farming experiments. On the basis of interviews with people sent down to rural areas of Guangxi, Schmalzer shows that a number of them used the opportunity to teach themselves with technical and scientific handbooks, and they later became self-trained agricultural technicians and officials in the agricultural sphere. Some of the interviewees, however, also recalled many failed experiments and accidents such as poisoning by improper use of pesticides.

In her final chapter, Schmalzer argues that the Maoist Green Revolution not only paved the way for modern industrialized farming in China but also provided a stimulus for green and organic farming movements up to the present day. The entomologist Pu Zhelong, for example, became one of the prominent voices warning of the impact of chemical insecticides on biodiversity. The recent organic movement also has provided space for the revival of *tu* science experiments: in Guangxi, Schmalzer visited model villages sponsored by the Huarun company, where peasants are (re)breeding a local indigenous pig as an alternative to intensive industrial livestock farming. China's Food Sovereignty movement also can be seen in the tradition of the Maoist dogma of self-reliance, calling as it does for farmers' rights to freely select and produce their seeds instead of being forced to buy patented seeds from (multinational) agrocompanies. In Schmalzer's words, "We might see history as the layers of soil in which current movements are planted. The past does not go away just because new layers are added: it gets plowed up, consciously or inadvertently, again and again to mix in new ways with the work of today" (227).

Schmalzer's book is an indispensable contribution to research on the rural and technological development of Maoist China, shedding light on lesser-known and (so far) less-researched facets of the scientific farming campaign. It is highly recommended reading for anyone interested in the rural development of Maoist China.

Reference

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